

- Technology Reviews, and
- Vendor Evaluation and Product Selection.

Our planning services are designed to present an interrelated set of services that position a company to easily and confidently move into the Design, Implementation, and Management and Support phases of any project.

Design services are structured to naturally follow planning services. Design services involve the development of specific tactical solutions and associated implementation plans. The methodology employed by these services is based on a highly iterative and client interactive approach. Technical recommendations produced by these services reflect a vendor independent evaluation process structured to provide "best of class" solutions.

#### **Benefits**

- IBM is driven by a commitment to provide quality solutions in a timely manner at reasonable costs.
- IBM is composed of individuals with a vast amount of knowledge in network planning and design services.
- IBM has a proven record of designing, installing and supporting some of the largest networks in the world.

#### **STRATEGIC PLANNING**

IBM Networking Services excels in helping clients use network technology to enhance their business productivity, agility and profitability. Our strategic planning service is designed to integrate a client's information movement and management needs with their business requirements. Using the latest in network technology and our methodologies, we analyze a client's information technology needs and develop a cost effective network architecture that results in measurable benefits to the business.

During the planning and design phase of our methodology, we define the requirements, technologies, standards, features and costs for all components of the enterprise network. In addition, our methodology defines measurable objectives and acceptable levels of risk for the project during the earliest phase of the design. These objectives and parameters are then reviewed throughout the project to ensure they are being met.

### **Benefits**

- IBM has a team of professionals with wide ranging skills often not found on our client's staff.
- Our perspective helps clients "think out-of-the box" by sharing our myriad of experiences in other companies, within multiple industries. This objectivity is also present in our recommendations, as we are not constrained in our ability to design "best-of-class" solutions.
- Our planning efforts are continuous in nature and can be completed in less time than similar internal planning efforts.

### **NEEDS ANALYSIS**

IBM specializes in helping clients review their current Information Technology (IT) environment to determine where network solutions may be required to achieve the full benefit of their IT investment. Our consultants are educated in all areas of information technology and can offer insightful, effective solutions to the many information management challenges.

Needs analysis is often performed as a precursor to a more thorough strategic planning or specific migration planning effort. Our consultants can work with you to carefully review your business needs and then develop potential network solutions designed to meet those needs.

Using state of the art tools and techniques, we can examine the operation, identifying and assessing the options available to meet the client's business objectives. The conclusions can be documented in a Functional Needs Analysis Statement. The Functional Needs Analysis Statement can empower the client in the attainment of their business objectives.

### **Benefits**

- IBM can quickly identify areas needing attention.
- IBM/ITC&IS's experienced personnel have performed numerous analyses for a variety of clients.
- The results of the needs analysis are presented in a clear and concise format detailing the areas in need of attention, potential remedies and estimated levels of effort required to fully define a solution for each issue.

### **TECHNOLOGY REVIEW**

IBM Networking Services offers focused technical reviews to help clients evaluate technologies for use in their organization. The technical review complements a needs analysis in that it is performed after all relevant business and technical needs have been identified. The technical review is a planning process involving the analysis of current and future technologies in light of the client's business needs.

A partial list of the technologies we can utilize to help solve information technology problems include:

- HighSpeed Cabling Systems,
- Virtual Workgroups/Network,
- Switched LANs,
- LAN to LAN Internetworking,
- Computer Integrated Telephony,
- Messaging Architecture,
- GroupWare Tools,
- Remote Network Monitoring
- Administrative Management,
- Middleware Imaging and OCR,
- Mobile Computing,
- Intelligent Networks,
- Custom Network Applications,
- Video Conferencing,
- Telemetry,
- Cellular Data Networks, and
- Multimedia Networks.

#### **Benefits**

- An understanding of the technologies best suited to serve a customer's information system needs.
- The result of the process can be a clearly defined migration plan showing the move from current technologies to future technologies.
- The cost in time and dollars of performing the necessary research internally for these technologies would be prohibitive for most client companies.

## ENTERPRISE-WIDE NETWORK DESIGN SERVICE

The Enterprise Network Design Service provides comprehensive engineering design solutions pertaining to all facets of a heterogeneous end-to-end inter-network. A partial listing of the technologies and issues relative to enterprise network design include:

<u>LAN Infrastructure</u>	<u>WAN Connectivity</u>	<u>LAN/WAN</u>
	<u>Internetworking</u>	
Physical Cable Plant	Circuit, Packet, & Cell	Subnetting, Addressing
Facilities	Switched Transport Services	LAN Topologies
Public vs. Private	Inter-network Security	Network Solutions
Backbone Architecture	Bandwidth Management	Multi-Protocol Routing
Wiring Hubs/Switches	Wireless Alternatives	Virtual Networks

The enterprise network design can typically follow a strategic planning process and provide the detailed design necessary to move the project towards implementation. This includes tasks such as product evaluation and selection, configuration planning, traffic analysis and other engineering efforts geared towards ensuring the final design meets the functional, technical and service level requirements identified in the Network Architecture plan.

### Benefits

- Proven design process ensures that solutions can be derived that effectively address business and technological requirements.
- Objective assessment of requirements and solutions using a vendor independent approach.
- Comprehensive design documentation and proven concepts ensure a customer's network can function as specified when installed.
- Structured network designs can be developed which optimize flexibility, scalability, manageability, and performance.

## **NETWORK CENTRIC SERVICES**

The IBM Network Centric Services offers network integration solutions involving shared network resources, applications and cross-platform interoperability. A partial listing of the technologies and applications for which design services can be provided include:

- |  |                                   |
|--|-----------------------------------|
| ▪ NOS Planning & Specifications        | Directory Services                |
| ▪ Network Printing                     | GroupWare                         |
| ▪ Electronic Mail / Messaging          | Electronic Data Interchange (EDI) |
| ▪ Fax Services                         | Computer Telephony Integration    |
| ▪ In/Outbound Communications           | Imaging                           |
| ▪ Remote Access/Mobile Computing       | Video Conferencing                |
| ▪ Host and Cross Platform Connectivity |                                   |

## **Benefits**

- Reduces the requirement for a customer's staff to stay current on numerous, rapidly evolving technologies.
- Proven design methodology assures that solutions will be derived that effectively address business and technological requirements.
- Objective assessment of requirements and solutions by vendor independent industry experts assures that complex network integration efforts are properly estimated and budgeted.
- Comprehensive design documentation facilitates successful and expeditious transfer of knowledge to present staff or when critically needed.

## **VENDOR EVALUATION AND PRODUCT COMPARISON**

The IBM Vendor Evaluation and Product Selection Service provides the customer with an objective systems evaluation resulting in an optimum set of product recommendations. IBM can work with the customer to define the criteria by which the vendors' products can be evaluated. These criteria can be focused not only on the generic properties of the products being investigated, such as throughput, latency, etc., but can also include the specific needs and environmental considerations of the customer. Once the criteria has been established, IBM can perform the necessary research and analysis to complete the comparisons.

The conclusions can be compiled with supporting text and graphics as required. Finally, IBM can discuss the findings, conclusions and recommendations with the customer.

### **Benefits**

- The customer leverages IBM's extensive expertise and experience in systems evaluation.
- IBM deals with all major vendors making a recommendation based solely on the best interest of our clients.

### **IMPLEMENTATION SERVICES**

Implementation Services incorporates the full suite of services necessary to provide client organizations with cost effective, reliable and unobtrusive installations. These services cover all aspects of implementation from project management and administration to product installation, configuration and testing. Our project managers and engineers are trained on all aspects of each implementation to ensure they are prepared for the many challenges implementations provide. During the implementation phase of a project, the service requirements, timelines, performance guidelines, and reporting hierarchies developed during the Planning and Design phase are further defined to fit the clients needs. At the end of the implementation, IBM provides detailed, as-built documentation of the project to position the client for the ongoing maintenance and support phase that follows.

### **Benefits**

- Utilizing skilled IBM resources to meet the increased personnel required to implement a large project can result in significant cost savings when compared to the addition of workforce to a customer's staff.
- IBM is in the business of designing, implementing and maintaining state of the art network systems.
- The Project Implementation Team can include the customer's staff, if the customer so desires.

### **NETWORK MANAGEMENT AND SUPPORT**

Once a company has completed the processes of planning, analysis, design, and implementation new systems must be supported. In migrating from centralized systems to distributed resources, client companies often experience a shifting of costs and resource requirements that must be adequately addressed. In the legacy "glass house" world, the major cost of information resources were the initial purchase and implementation, whereas networked resources tend to have less purchase and implementation cost but require more ongoing management and support. This cost and resource shift is not because networked resources are less stable but more because networks are so flexible that they tend to evolve as a company's business evolves. This is

one of the principal benefits of networks, their ability to adapt to changing needs. However, this evolution must be properly managed and ongoing functionality properly supported to maintain the network's value to the client. This category of services includes a variety of service offerings:

- Help Desk OnSite
- Technical Support
- Change Management
- OnCall Technical Support
- Remote Monitoring

### **Benefits**

- This service allows the client to concentrate on their core business rather than the maintenance and support of information technology.
- The combination of proper strategic planning, well-engineered design, and effective, incremental change management greatly reduces the need for future "fork lift upgrades".
- By utilizing IBM's maintenance and support offerings, customers can benefit from IBM's investment in people and equipment without carrying the entire financial burden.

### **Specialized Services**

The Specialized Services offered by IBM consists of a variety of well-defined offerings. These offerings are designed to provide specific benefits to the client at low cost and with a short delivery cycle. Examples of the types of services contained in this category are:

- Network Performance Audit,
- Network Security Audit,
- Benchmarking,
- Reliability / Fault Tolerance,
- Network Device Survey (existing resources),
- Environmental Certification,
- Change Impact Audit,
- Internet/Intranet Planning and Design,
- Network Systems Management Methods, and
- Skills Transfer.

### **NETWORK PERFORMANCE AUDIT**

A network performance audit can be based on a variety of criteria depending on client need. An example of such an audit consists of a business cycle capture of the traffic across a given network. A business cycle will generally refer to a single, continuous 24 hours a day or a continuous 7x24 week (a week is preferred). A true business cycle would be a full fiscal year and, while this would be far more informative, it is not realistic for most clients. To insure the validity of the audit, some upfront work should be completed to determine how utilization fluctuates throughout a fiscal year. Also, the capture should be performed during the busiest period of a business cycle. For larger networks, segmentation must be considered. The client company has the option of auditing a single segment, a set of segments, or all segments. The capture is analyzed and a set of analytical charts and graphs with associated descriptive narratives would be added. The resulting report will show average, peak, and spike utilization through the audit period. It will also show available bandwidth, provide a breakdown of traffic by protocol, and show errors by frame type.

### **NETWORK SECURITY AUDIT**

This audit uses the NCSC standards (A through D) to establish the level of security exhibited by the target system.

### **BENCHMARKING**

Captures, with associated graphic analysis, that can be used for reference over time or in implementation and migration planning. These captures and documentation could also be archived by IBM/ITCIS, together with descriptions of the networks from which they were taken, to provide supporting information for design processes.

### **RELIABILITY / FAULT TOLERANCE**

A series of tests that define how the network responds to common types of disruption such as power failure, component failure, unanticipated changes in utilization, user related failures or disruptions, etc. This audit would involve real world tests, modeling, and result projections due to the potentially destructive consequences of certain kinds of system failure.

### **NETWORK DEVICE SURVEY (EXISTING RESOURCES)**

Client organizations that have existing networked resources of any significant size often do not have an accurate record of what devices and applications are working on their network. This service would provide an inventory of devices with varying levels of information and could include applications, protocols, topologies, etc. Device information could include user(s), physical location, logical address, device type, device inventory id code, department, etc. In addition to performing the inventory, IBM could provide the client organization with a package of tools and procedures to maintain the inventory in the future.



## **ENVIRONMENTAL CERTIFICATION**

The Environmental Certification would indicate if a planned application would have the necessary resources to function reliably on the target network and if the application would create problems with other aspects of the networks performance and reliability. Where Problems are indicated additional services could be provided to correct them.

## **CHANGE IMPACT AUDIT**

Where specific reliable environment requirements are not available or where the implementation involves changes other than application implementation such as topology changes, protocol changes, component changes, etc. System modeling together with research involving similar systems could provide the client with reasonable expectations of the impact of the planned changes.

## **INTERNET/INTRANET PLANNING AND DESIGN**

Gain Access; develop a World Wide Web (WWW) Presence, Integrate business applications and/or Enable Electronic Commerce. We test and verify our tailored installations of "firewall" solutions and security measures. IBM can help a client decide on Compatibility, Scalability, Performance, Reliability, Security and Management requirements

## **NETWORK SYSTEMS MANAGEMENT METHODS**

IBM can help a client understand the concepts of internetworking management and provide SNMP based tool solutions; along with skills transfer consistent with client needs. Physical plant management is often overlooked, but can be a frequent cause of network failure. Operational, administrative standards and procedures are keys to reliable network performance. IBM can help a client leverage "Best Practices" and technology to meet the client's business needs.

## **SKILLS TRANSFER**

Skills transfer allows a client to understand and manage networking technology effectively and efficiently.

## **Benefits**

- Most specialized services are designed to provide quick solutions to specific objectives.
- All services are designed to be used alone or combined in unique ways to meet a customer's needs.
- All services are structured to focus on generating measurable benefits and avoid spending valuable budgetary resources on "yet another study".

## **NETWORK AND DISTRIBUTION SYSTEMS MANAGEMENT**

### **IBM Network Systems Management Services**

IBM Network Systems Management Services (IBM/NSMS) delivers what a client needs to manage networks. Networks are dynamic, evolving entities that require on-going management to function optimally. IBM can help clients understand the concepts of network management and provide solutions and at the same time transfer critical skills to the client's own staff.

IBM Network Systems Management makes it easier for a client to manage networked systems, applications, security, and other assets. True network management has historically been a privilege of larger systems. Not any more, IBM is now bringing the client the expertise the client wants, right down to every desktop, every server, and every component. IBM can bring a client the tools, and the techniques for complete network control, complete network monitoring, and complete network management.

### **Systems Management**

With support of industry standard SNMP over IP, IPX, NetBIOS, and SNA (over AnyNet\*), now the client can support any device with an SNMP agent.

Clients can improve end user productivity and reduce the costs of managing multi-vendor LANs with expertise from IBM. Network management proactively recognizes and isolates faults, instead of requiring laborious troubleshooting. Every business needs systems management control of their networks in:

- Network and system fault management,
- Configuration management,
- Applications management,
- Security management,
- Accounting management
- Software distribution,
- System performance management, and
- Backup & business recovery.

Whether the client's enterprise runs on HP OpenView, Tivoli/NetView, Spectrum, or Sun NetManager, IBM IBM/NSMS can help a client with all of the network management foundations. Network monitoring, network control, and network management allow a company to efficiently run its network resources without any service interruptions. IBM can help a client with:

- Event and problem resolution,
- SNMP based management solutions for trap processing, trap automation, MIB data collecting and graphing,
- Physical plant management standards, change control, and documentation techniques,
- Operational and administration best practices,
- Traffic pattern analysis, balancing and growth planning,
- RMON applications, and
- Help desk management.

#### **Configuration Management**

One of the biggest headaches network managers face is configuration management. The need to upgrade software applications to new releases, or to ensure company standards, or to configure hardware settings - the process can be mind-boggling. IBM has the know how and the means to make it simpler.

- Configuration standards planning,
- Network operations & configuration management,
- Device management and configuration tracking,
- Network topology control,
- Remote device configuration, and
- Application management

Application control can be an endless task. New software brings enhancements and more functionality, but also increases network administration. With the proper tool set from IBM, network management becomes smoother. IBM can show a client how to control:

- Operating system versions,
- Databases, ODBC, front-ends, back-ends,
- Software applications,
- Network drivers, and
- Protocol stacks.

### **Security Management**

A client's network needs security like never before. With the Internet and the world now at the front door, clients want to keep the world out of network layers, sensitive data, and e-mail, and they want an environment free of viruses. IBM offers comprehensive, and technologically advanced tools, and methods to keep a network safe. Our insight and experience can open new ideas on how a company can further its access control, resource protection, identification & authentication, and security administration. Our expertise can help a client additionally with:

- Internet firewalls,
- Virus protection,
- Security policy and procedure, and
- Communications safeguards.

### **Accounting Management**

Engineering needs more disk space, sales people have run out of user licenses, five new people are being added in finance, distribution is being upgraded this weekend—all for a client to keep in line and accounted for. IBM knows where and how to keep a client going—without the pain. No other company can offer a client successful and proven methods for:

- Accounting and departmental chargebacks,
- Change management,
- Asset management,
- Software license monitoring, and
- Network administration of users.

### **Software Distribution**

Imagine going to every desktop in the company to install, or upgrade new software. A client can now automate all of those tasks with help from IBM.

- Distribute software and data, and control changes using centralized management,
- Check workstation capabilities with change control,
- Use IBM methods and tools to support multi-vendor environments, and
- Maintain network control without extensive programming overhead.

### **System Performance Management**

IBM can provide a client with the insight on how to manage and increase network performance.

To maximize LAN performance and increase business productivity, a client's environment requires expert analysis and recommendations from IBM professionals. Our services focus on providing a client with the information clients need to understand current network utilization, network performance, and network traffic patterns. Information provided from network analysis provides a baseline of current network operational characteristics, which provides a measurement for ongoing technology implementations. IBM can give a client insight into:

- Network performance and analysis reporting,
- Performance monitoring,
- Capacity planning,
- Network analysis, and
- Design improvements and recommendations.

### **Overall Network Systems Management Benefits**

IBM/ITCIS offerings for systems management benefits our customers with increased network control of all local, and wide area network resources. Our expertise in multi-protocol environments allows clients greater network control without crisis management.

- Configuration management benefits network managers with easier control of all network devices. Whether it's a network file server, workstation, router, concentrator, LAN switch, or printer—all of a network's configuration information can be stored and documented for easy access and control.
- Application management benefits all of a client's installed base of network operating systems and business critical software releases. Now, not only are all of applications current, they are properly licensed, as well as compliant with company standards.
- Security management can help clients reduce the threat to their network by better controlling access, reducing "IP spoofing", implementing authentication and encryption, and making sure network integrity is maintained.
- IBM can help reduce a client's network administration efforts. With our systems accounting management tools and methods, customer service to a client's user community improves with better network administration of users, better change control and change management, and better control over daily operations.

- Software distribution performs remote unattended installation of software on network workstations, reducing not only the time and effort for installation, but also the number of queries and problems arising from incomplete or failed code distribution.
- Our software distribution and change management features include change logging, problem tracking and change scheduling—all designed to make routine tasks easier for clients.
- System performance management can help isolate network problems with bandwidth constraints, network application errors, routing problems and more. As networks grow more and more complex, clients need complete network control that spans 24 hours a day, 365 days a year. IBM Systems management coupled with IBM performance management allows a cost-effective solution for full time, online availability of the network.

IBM Network Systems Management delivers all the benefits for LANs, WANs, and the entire enterprise—with the solutions that are not only desirable, but also affordable. If clients need control of their network, LAN-to-LAN, LAN-to-WAN, Internet or Intranet, IBM can help them with all of their network computing.

## **Video Distribution**

### **SWITCHED VIRTUAL NETWORKING**

Distributing video on today's networks requires scaleable levels of bandwidth. An ideal networking infrastructure would be capable of carrying all information types data, voice and video concurrently, delivering the performance required for each application and user, optimizing the use of network resources and minimizing networking costs. The demands placed on a client's network to provide new levels of connectivity while maintaining current levels of performance require an evolutionary change in network design. As new applications force the integration of these technologies IBM has developed several solutions. One such solution IBM has developed is Switched Virtual Networking (SVN). With SVN, clients can optimize performance requirements against the cost constraints they face daily while meeting the bandwidth requirements required for concurrent deployment of data, voice and video on the network.

SVN allows clients to solve today's most pressing networking problems for bandwidth demand at a lower cost while they build a foundation for the newest that network computing has to offer. Full-motion video, voice and other collaborative, or bandwidth-intensive, applications benefit from a high-performance switched environment. By integrating advanced functions and technologies, SVN provides the scalability and dynamics necessary to form the infrastructure for network computing.

The architectures within SVN are founded on open, standards-based building blocks designed to integrate major network elements, both new and existing, onto common transport and protocols, through a smooth migration path. SVN lets clients move at their own pace without making changes that might disrupt operation of their existing network.

### **ASYNCHRONOUS TRANSFER MODE (ATM)**

The benefits of Asynchronous Transfer Mode (ATM) technology have been well chronicled: low-cost hardware that supports scalable networks composed of high-bandwidth links with Quality of Service (QoS) guarantees. These characteristics allow ATM networks to support a variety of different applications including voice, data, and multi-media traffic. Hardware switching is one of the fundamental components that enables ATM to offer these features. The advantages of hardware switching have also been widely realized in Local Area Networks (LANs). Together, ATM and LAN switching provide the foundation for a high-performance networking infrastructure that supports both current and future needs. IBM's Multi-protocol Switched Services (MSS) complete this picture by providing key routing, bridging, and server functions that integrate legacy LANs with high-speed ATM networks in a manner that protects both hardware and software investments.

### **FDDI**

IBM recognizes the need to integrate multiple network architectures such as FDDI and ATM. IBM's Switched Virtual Networking (SVN) and award-winning Multi-protocol Switched Services (MSS) offerings put switched ATM closer to today's multi-protocol workgroups. FDDI connectivity with MSS allows data to be routed from FDDI to ATM.

## **Installation of Hardware and Support**

### **IMPLEMENTATION PLANNING**

Network design consultants can provide the necessary planning which will properly position the new design with the phases and the integration of the existing, new and future networking components. The plan will include the physical design criteria and be the hand-off to the physical designer and construction manager.

### **MIGRATION PLANNING**

This task is to determine how the existing equipment can be utilized and the new design can be implemented during the cutover period. This also includes looking at the skills of the operations staff, users, and level support to ensure all have the proper skill base to take over the installed network and systems.

## **QUALITY ASSURANCE CHECKS**

Network design consultants can perform a quality assurance check where the components are validated to ensure they can be installed within a client's environment including local and state codes. The system's ability to support defined needs or requirements are validated, calculations are re-checked, analyses are reviewed, and validation that the system will fit into a client's management strategy and style.

## **INTRANET AND INTERNET ACCESS**

Driven by Internet standards and technology, we are connecting systems, people, and institutions. In the process, we're integrating the computer into business and society and participating in one of those historic transformations that occurs perhaps once in a generation.

## **INTERNET ACCESS SOLUTIONS**

Enterprise networks now offer the world access to their resources with the use of the Internet. Now applications reach a new user community—almost everyone. IBM has the tools and the resources to give a company a worldwide presence, with the management, security, and reliability they need. IBM can give clients the direction on how to design, install, and support Internet / Intranet servers, firewalls, Internet applications, and more. IBM Global Services can support almost any hardware or software. If interoperability includes Windows 95®, NetWare™, OS/2 Warp™, AIX®, Windows NT™, Solaris™, HP-UX™ or others, we have the connection for clients on Intel, and many other platforms. We can even help clients on non-IBM platforms. At IBM, we're constantly thinking of ways to maximize the value of information to a client's business. We can provide expertise in areas of:

- Firewalls and proxies,
- Security risks & requirements,
- Internet business growth capabilities,
- Internetworking & infrastructure,
- Intranet development and control, and
- Lotus Domino.

## **ELECTRONIC COMMERCE**

If a client is looking to expand their business products and services on the World Wide Web, IBM is the right choice. Electronic commerce can now give a company the ability to conduct sales, perform purchase order processing, process secured credit card transactions, and distribute products. Whether you are a retailer, franchiser, or a distribution leader, IBM has the right set of services. IBM can provide:

- Internet services for distribution specific industries,
- Internet purchasing services for government and business,
- Tools for secure commercial processing of credit card transactions,
- Internet tools to develop product catalogs and online purchasing, and
- Intranet server configuration for increased divisional and departmental efficiencies.

*IBM can give clients a broad range of Internet / Intranet networking choices. IBM Global Services can show a company how to make the most of their networking connectivity with Internet / Intranet solutions to enhance routing, security, and control using proven technologies.*

We offer products and services that bring superior scalability, high system availability, maximum network availability, all across a wide range of network configuration.

IBM Global Services can help clients determine how to incorporate the Internet into their business strategy. We can help clients build a solution, and build a strategy for worldwide access.

We can help clients establish the connection and security they need to access the Internet. We can show clients how to create security between HTTP client / server to enable simultaneous transactions.

IBM can help clients develop the key Internet / Intranet management policies and procedures, and management of other security related tasks.

- IBM can guide clients with Internet connections using secured network gateway installation services, and selecting an Internet Service Provider.
- IBM can show a client how to leverage the Internet for business applications for a competitive advantage.
- IBM can help install a client's firewall hardware and software required to quickly bring online a secure Internet connection.
- IBM can help clients build an Intranet. We can show a client how to determine and develop infrastructure needs, security, and install the correct combination of network hardware and software.

- Increase communication and productivity within an organization using Intranet applications from IBM. Clients can count on improved inter-company communications using our services to expand network's capabilities.
- Utilize IBM specialists to install and configure Web servers, Web browsers, and enable proxy support for remote servers not directly connected to your network.
- IBM Global Services can provide clients the direction and consultation for multi-vendor environments, including evaluating which products bring your company access control, intrusion detection, Java security, encryption, and e-mail.

With our products and services, IBM is aiming to be an enabler for network computing. IBM Networking solutions, based on interoperability, are the framework of IBM's plan for network computing. IBM Networking solves client problems by providing world-class Internet, Intranet, and company wide infrastructure solutions that enable the latest network-computing applications at the lowest total solution cost.

### **Network Training Methodologies**

IBM can develop training methodologies that can address each level of the standard OSI network model, as it pertains to and is implemented within the EPISD network:

- Application - Applications layer include Notes Client, Netware Requester, 3720 Terminal Emulators, TELNET, TN3270, TN5250, etc.
- Presentation - Presentation layer includes operating system like Windows 95 and NT Graphical User Interface (GUI), as well as DOS command interface
- Session - Session Layer TCP (when following pure TCP/IP model), APPN, UDPetc.
- Transport - Transport Layer to include TCP, SPX, SNA/APPC. This layer includes gateway technologies.
- Network - Protocols to include IP, IPX, SNA/LUX, etc. This Layer includes router technologies.
- Data Link - Interconnect methods as determined by Institute of Electrical and Electronic Engineer (IEEE) Specifications. The specification include 802.2/802.3 for Ethernet (i.e. 10BaseT/Tx, 100BaseT/Tx/Fx, 1GBaseTx/Fx), 802.5 for Token-Ring, FDDI, and ATM. This layer includes bridging technologies.
- Physical - Twisted Pair, Multi-Mode Fiber, Single-Mode Fiber, Copper Repeaters. This layer includes switched and wireless technologies.

IBM can develop a process for the purpose of network solution training, as follows:

- Assess the skill capabilities of all a client's network administrative personnel and develop a comprehensive skill matrix.
- Skills transfer with a client's network administrative personnel, during deployment of all a client's network components (i.e. network management technologies, network hardware technologies)
- Development of customized curriculum for customized and on-site courses for a client's network support personnel. This can include training for all IBM and non-IBM network hardware and software.
- Development of education plans for a client's network support personnel for all off-site courses. This can include training for all IBM and non-IBM network hardware and software.
- Develop interview process, skill profiles, and development plan methodology for a client's new hires in network administration area.

In addition, IBM Global Services offers IT training through a wide curriculum of IT-related courses, from Application Development, to Operating Systems, to Cisco product implementation. For a full review of our offerings, please visit our Web site at <http://www-3.ibm.com/services/learning/us/>.

Be sure to read about our Education Card, a fixed price per person per year that makes all this training a very affordable proposition to El Paso ISD.

## **Approach, Qualifications, and Industry Experience**

### **IBM NETWORK SOLUTION DESIGN METHODOLOGY**

IBM has long been known for our strength in SNA networks; however in the past decade we have been very much involved in the development of multi-protocol networks, non-SNA industry standards, open architectures and multi-vendor client server networking solutions. We have amassed a vast amount of experience in these areas and have organized these skills into competency groups that assist our clients to implement effective network solutions for their business. Our capabilities include:

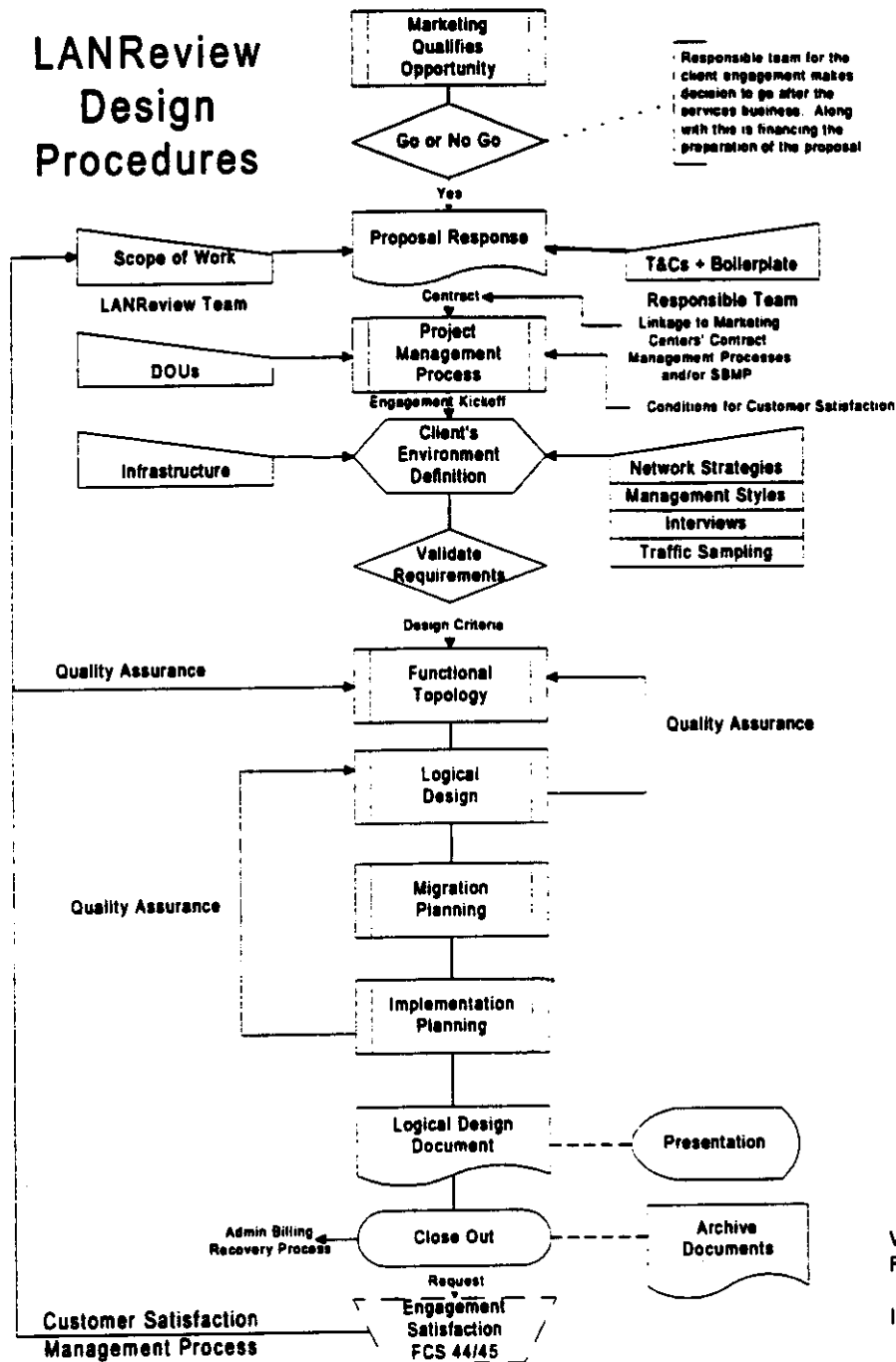
- Infrastructure Engineering - Evaluation of campus requirements for data, video, voice, and other systems that could use a backbone utility. Validation of requirements against business objectives, technology, implementation, time frames, resources and manageability. Base lining of networks can provide a reference point for future changes in performance, physical design, and functional capability.
- New Technologies - Analyzing and predicting the impact of image, video, and voice on systems and networks; building networks based on routers, hubs, and packet switches.

- **Application Analysis** - Determining the impact of new applications on systems and networks.
- **Multi-vendor/Multi-protocol** - Examining the interaction of multi-vendor/ multi-protocol systems and networks.
- **Network Assessment & Design** - Planning efficient networks and systems that meet client needs and optimize the performance and minimize cost.
- **Client-Server/Open Systems** - Determining the performance, capacity, and placement implications of new Client/Server and Open Systems environments.
- **Physical Design** - Registered BICSI Designers design/specify network infrastructures that are compliant with industry standards.

We employ a consulting approach that draws its strengths from the input and active participation of a client's staff, coupled with our business experience and technological expertise. We deliver recommendations based on vision definition, workflow analysis, and business impact identification. We are successful because of our intense focus on meeting and exceeding client expectations. The best gauge of our success to date is a high level of follow-on business from our clients.

To perform complex campus designs IBM Global Services deploys specialists from several disciplines to form a team of experts in all aspects of network computing. Network architects from our LANReview group perform logical design services; designing distributed networking transport protocols within IEEE 802.X, ATM, and FDDI standards. Traffic analysis and data modeling is conducted by members of our SNAP/SHOT and NetReview Services groups. These modeling activities can produce server, router, Ethernet and 3270 traffic estimates, topology constraints, and site network interaction patterns which our network architects will use to determine bandwidth requirements and network resource capacity requirements. Registered designers, using industry standards, will apply the logical design and all its requirements, to a physical layout and document the physical network.

# LANReview Design Procedures



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## **5.5 Commitment to K-12 Education**

IBM has a strong commitment to K-12 education. This strength comes from our belief that a sound K-12 system is an essential component of our nation's future. Our commitment is regularly voiced by our chairman, Lou Gerstner, and supported by the entire IBM workforce through their personal contributions of technology and time to K-12 institutions. It is further augmented by the skills and focus of our Education Industry unit and the projects we implement for school districts throughout the world. In fact, IBM is the largest contributor to the K-12 industry of any major corporation and has the largest business unit focusing exclusively on K-12. This business unit allows IBM to focus resources on K-12 districts in the following ways:

- In a manner that reflects their needs.
- With a deep understanding of the issues they face in using technology.
- To share best practices amongst all the school districts in the United States that IBM works with.

IBM's commitment to education goes beyond U.S. borders and pure economics. It is grounded in the belief that the quality of education is a preeminent concern of people everywhere and is an issue that deserves the full attention and cooperation of corporations worldwide. In support of this belief, surveys indicate that education ranks as a high personal priority for IBM employees around the world, both as a civic issue and as an area in which they participate locally on a volunteer basis.

There is yet another reason for IBM's commitment to education – our ability to make a difference. As a leading technology and solutions company, IBM demonstrates daily how technology helps business and major institutions operate more effectively. In a similar way, our technology, experience, and talent bring substantial and structural improvements to many aspects of elementary and secondary education.

IBM's goal is to support the most effective education producing the highest level of student achievement, for all children, in all communities. We work toward this goal through strategic research and development, community and civic involvement, and targeted philanthropic efforts. For example, our K-12 Education Industry Solution Unit works with educators and administrators across the country to create vision and solutions that foster student success and encourage school reform. In addition, through the company's Reinventing Education grant program, IBM partners with school districts across the U.S. to help them develop innovative uses of technology to create better schools.

## **Transforming Education through IBM's Reinventing Education**

Reinventing Education is IBM's funded initiative to support fundamental restructuring and broad-based systemic change to improve student performance and operations in the public school system. IBM has formed partnerships with 21 school districts and states that are prepared to review and revise traditional operational assumptions and practices in order to reinvent American schools. The following are some examples of these partnerships:

### **MEMPHIS CITY SCHOOLS, TENNESSEE**

Educators in Memphis are committed to performance-based portfolio assessment as a way of measuring student progress toward mastering complex skills. Using the Performance-Based Assessment Tool through Reinventing Education 2, teachers receive training in portfolio assessment by practicing with pre-scored student work. Teachers evaluate pieces of pre-scored work on multiple criteria, before studying the "true scores" and the rationale behind them. When judging their own students work, teachers have reference materials at their fingertips. By a simple click of a mouse button, they can view the rubrics for a particular assignment and bring up benchmarks that demonstrate high-quality performance standards, thus providing scoring anchors that promote uniform assessment of student work.

The Performance-Based Assessment Tool also provides teachers with summary profiles of student performance so that they can understand the academic strengths and weaknesses of an individual student, as well as those of an entire class. The tool thus helps teachers improve their own instruction to respond to student needs, thus creating a powerful form of professional development.

The Performance-Based Assessment Tool is supported through Wired for Learning technology so that teachers can communicate with one another to strengthen their assessment efforts and so that teachers, parents, and students can engage in on-line discussions on children's Learning Progress.

### **BROWARD COUNTY PUBLIC SCHOOLS, FLORIDA**

IBM and Broward County developed a data warehouse solution that addressed the district's needs for decision-making across the organization specific to their efforts in transitioning to a site based management model. The data warehouse is a customized system for school-based data collection, retrieval, and analysis and delivers information to educators, administrators, and parents and enables them to make decisions on a wide range of subjects including, curriculum, budgets and personnel.

### **CHARLOTTE-MECKLENBURG SCHOOLS (CMS), NORTH CAROLINA**

IBM and CMS have developed Learning Village, an innovative solution that bridges the gap between school, home and community. Learning Village allows parents to examine their children's assignments and progress against Charlotte's academic standards over the

Internet. Learning Village also provides another benefit through the Internet - enabling parents to conference with teachers at their convenience. Through the instructional planner, teachers can create student projects that are standards-based and use the curriculum resources offered by both the district and participating institutions.

#### **SCHOOL DISTRICT OF PHILADELPHIA, PENNSYLVANIA**

Through the Reinventing Education partnership, IBM and the School District of Philadelphia are developing software called Watch-me! -Read that will help students in grades 1-5 gain a solid foundation in reading. IBM is using interactive speech recognition technology as the basis for this innovative application and has collected over 40,000 utterances from 800 children around the country to capture a range of intonations and accents that will enable the program to communicate with children of varying backgrounds. The partnership is using technology as an integral component in the design of Continuous Practice Improvement classrooms for professional development and school sites that allow teachers to collaborate in the creation and sharing of high standards of practice.

As a result of these and other initiatives, new solutions are available for replication by schools nationwide to address some of the current problems faced by today's educators, administrators, parents and communities.

#### **STATE OF MARYLAND DEPARTMENT OF EDUCATION**

IBM is partnering with the Maryland State Department of Education to implement the Digital (Authentic) Portfolio Assessment. Tool to strengthen the link between the performance-based component of the state's high stakes test and classroom instruction. The authentic assessment tool will be made available on the Maryland Department of Education web site to give parents and teachers the opportunity to use the tool and better understand this type of assessment.

Many districts and states are turning to portfolios as a way of assessing students, rather than depending on a single multiple-choice test. Portfolio assessment helps teachers focus their instruction around tasks that are conducive to standards-based evaluation. This method also allows teachers to provide students and their parents with more in-depth, constructive comments that are focused on the skills that students are expected to know and master.

Using the tool, teachers and parents are exposed to portfolio assessment by practicing with pre-scored student work; they evaluate pieces of pre-scored work before revealing their "true scores" and the rationale behind them. When judging their own students' work, reference materials -- in the form of assessment criteria, or rubrics, and performance objectives, or benchmarks -- are placed at the fingertips of teachers. By a